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b. Applicant(s)	g. Disclaimer	I. Print Fig.	q. PTOL-85b					
c. Continuing Data	h. Microfiche Appendix	m. Searched Column	r. Abstract					
d. PCT	i. Title	n. PTO-270/328	s. Sheets/Figs					
e. Domestic Priority	j. Claims Allowed	o. PTO-892	t. Other					

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	A1	6,139,700	10-31-2000	Kang, et al.	204	192.17	09-30-1998	
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	B2	WO 02/08488	01-31-2002	WIPO	C23C	16/44	THE STATE OF A
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Filing Date	06/20/2001
First Named Inventor	Mak et al.
Group Art Unit	2812
Examiner Name	unassigned
Attorney Docket Number	5351/AMI-00-12

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Application Number	09/885,609						
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P	E CODS	210 101 101111 7440	00,, 10		Application Number	09/885,609
	MF	ORMATIC	N DISC	LOSURE	Filing Date	06/20/2001
3	oo Sta	TEMENT	BY AP	PLICANT	First Named Inventor	Alfred W. Mak
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	Sheet	4	of	4	Attorney Docket Number	5351/AMI-00-12

OTHER PRIC	OR ART -	NON PATENT LITERATURE DOCUMENTS	-
Examiner Initials*	Cite, No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
-		Klaus et al. Atomically controlled growth of tungsten and tungsten nitride using	
	со	sequential surface reacions, Applied Surface Science, pp. 479-491(2000).	
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Sheet

5351 / AMI-00-12

Complete if Known Substitute for form 1449A/PTO **Application Number** Unassigned INFORMATION DISCLOSURE **Filing Date** Herewith 56. STATEMENT BY APPLICANT First Named Inventor Mak, Alfred õ **Group Art Unit** Unassigned (use as many sheets as necessary) Unassigned **Examiner Name**

Attorney Docket Number

	U.S. PATENT DOCUMENTS										
Examiner	Cite	U.S. Patent Document	nt Kind Code ²	Name of Patentee or Applicant	Date of Publication of Cited Document	Pages, Columns, Lines, Where Relevant					
Initials*	No.	Number	(il known)	of Cited Document	MM-DD-YYYY	Passages or Relevant Figures Appear					
	AA	5,866,795		Wang et al.	02-02-1999						
	AB	6,071,808		Merchant et al.	06-06-2000						
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	AH	6,144,060		Park	11-07-2000						

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Examiner Initials*	Cite No.1	Foreign Patent Document				Date of Publication of	Pages, Columns, Lines, Where Relevant	T	
		Office ³	Number ^a	Kind Code [®] (if known)	Name of Patentee or Applicant of Cited Document	Cited Document MM-DD-YYYY	Passages or Relevant Figures Appear	Τ*	
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¹Unique citation designation number. ²See attached Kinds of U.S. Patent Documents. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.

26. (Withdrawn) A method for forming a metal contact stacked barrier layer on a substrate surface, comprising:

exposing the substrate surface to a first reactive gas;

exposing the substrate surface to a second reactive gas;

sequentially repeating the exposure to the first and second reactive gases until an adhesion layer having a desired thickness is formed;

exposing the substrate surface to a third reactive gas;

exposing the substrate surface to a fourth reactive gas; and then

sequentially repeating the exposure to the third and fourth reactive gases until a barrier layer having a desired thickness is formed over the adhesion layer.

- 27. (Withdrawn) The method of claim 26, wherein the first reactive gas comprises a refractory metal-containing compound.
- 28. (Withdrawn) The method of claim 27, wherein the refractory metal-containing compound comprises TDMAT, TDEAT, TiCl₄, or combinations thereof.
- 28. (Withdrawn) The method of claim 27, wherein the second precursor gas comprises a reducing compound.
- 29. (Withdrawn) The method of claim 28, wherein the reducing compound comprises H₂, B₂H₆, SiH₄, NH₃, or combinations thereof.
- 30. (Withdrawn) The method of claim 27, wherein the third precursor gas comprises a refractory metal-containing compound.
- 31. (Withdrawn) The method of claim 30, wherein the refractory metal-containing compound comprises tungsten.
- 32. (Withdrawn) The method of claim 27, wherein the fourth comprises a reducing compound.